

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the matter of

Federal-State Joint Board on
Universal Service

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CC Docket No. 96-45

**Comments On Updating Line Counts and Other Limited
Information Used in Calculating High-Cost Universal Service
Support For Non-Rural Carriers**

I. INTRODUCTION AND SUMMARY

The Maine Public Utilities Commission and the Vermont Public Service Board (“Rural State Commissions”) are pleased to file comments in response to the Notice of the Wireline Competition Bureau (“Bureau”), DA 04-3269 released on October 15, 2004. The notice requested comment on how line count and other discrete input values should be updated for the purpose of determining support using the revised version of the Federal Communications Commission’s (“FCC’s”) cost model.

The Bureau uses ARMIS special access line count data as inputs to the Commission’s cost model. This includes the count of DS-2 and DS-3 lines, even though the model was never designed to model the cost of these services. In addition, the use of 1998 data to allocate special access totals among wire centers in each study area distorts line counts in a way that disadvantages rural areas and deprives them of sufficient support. Finally, switched line counts may be inaccurate because carriers may not be reporting UNE lines.

The Commission has been unwilling to address the broader issues raised by this special access data problem. These involve gathering newer and additional data as well as changes to the model. Until those problems are addressed, the Bureau should refrain from updating special access line counts because doing so would, in the absence of other offsetting corrections, lead to selective and unbalanced results. Instead, to minimize systemic error and the risk of insufficient support, the Bureau should use special access line counts from an earlier year, ideally ARMIS 2000 data. Alternatively, it should restore the 2000 support levels provided to nonrural carriers. The Bureau should also direct carriers to include UNE lines in their switched line counts.

II. SPECIAL ACCESS LINE COUNTS

The notice sought comment on using 2003 ARMIS special access line reports as input values for the purpose of estimating average forward-looking costs and determining support for non-rural carriers in 2005.

A. The Bureau's current data processing practices

The Bureau follows a three-step process to convert special access input data to model-based cost. First, pursuant to the Bureau's specific direction, carriers include all "sizes" of special access lines in the ARMIS report on a per-voice-line equivalent or "channel" basis. One DS-1 line generates 24 channels, and one DS-3 line generates 672 channels. This information is reported annually by carriers at the study area level.

Second, the Bureau distributes these special access channels within each nonrural study

area to specific wire centers. The distribution is made in the same proportions that were reported in a study conducted in 1999 based on line sales at the end of 1998. These distributed channel counts then become an input to the cost model.

Third, the cost model “deploys” virtual facilities sufficient to construct a virtual network. The model assumes that all special access lines reported by carriers are a specified mixture of DS-1 and DS-0 lines.¹ In effect, a single real DS-3 line is treated as if it were 51.4 wire pairs in the form of DS-1 circuits² plus 55.4 wire pairs in the form of DS-0 circuits.³ The end result of the report of a single DS-3 facility reported in ARMIS is that the model adds 107 “phantom” two-wire circuits to its conception of reality. Additionally, those phantom circuits are deployed in wire centers throughout the study area, and not in the wire center where the DS-3 service is actually located.

B. Problems with the current practices

The current practice produces two errors. The first error occurs at the study area level. The model makes no effort to calculate the cost of DS-2 and DS-3 lines.⁴ It is improper on its face to use input data, in the form of DS-2 and DS-3 special access channels, that the model was never designed to use.

¹ The model presumes that 91.75 percent of special access channels consist of 24-channel DS-1 circuits operating on a four-wire circuit. Therefore, each wire pair supports 12 channels of DS-1. The model also assumes that 8.25 percent of special access channels consist of DS-0 circuits, each of which operates on a single two wire circuit. *Joint Board on Universal Service*, CC Docket No. 96-45, *Tenth Report and Order* (“*Tenth Order*”), para. 100.

² $672 \times 0.9175 / 12 = 51.38$.

³ $672 \times 0.0825 = 55.44$.

⁴ The Commission has admitted that it never designed the model to “allow for the deployment” of DS-2 and DS-3 circuits. *Tenth Order*, note 242.

Using that data is highly likely to create systematic and non-trivial errors. As explained above, the Bureau's present procedure produces "phantom" loops in the study area. The error directly affects costs because a single DS-3 circuit does not have the same cost as 107 DS-0 circuits.⁵ Therefore the model's cost calculations are unreliable in any study area in which a carrier has reported the existence of any significant number of DS-3 circuits.⁶

Second, there are line count errors in most wire centers. As noted above, the Bureau does not collect current data on the wire centers in which these reported DS-2 and DS-3 circuits are actually located. Instead, the Bureau allocates channel equivalents throughout rural and urban areas alike based on its 1999 data study, which used 1998 data. The 1999 study was never an appropriate basis in the first instance to allocate special access lines, because it did not report the same things that the ARMIS data reports.⁷ The wire center data for 1998 are now six years old. Since 1998, use of special access circuits by business and by competitive LECs has increased dramatically. There is no valid reason to believe that the location of special access and private line circuits in 1998 is a reliable predictor of the current location of special access circuits.

C. The likely effects on cost outputs

1. The study area problem – too many lines in the study area

⁵ The Commission has never found that the costs are even approximately equal, and they are not. The difference in cost creates a clear advantage to purchasing a DS-3 circuit when volume is sufficient to justify the cost.

⁶ Moreover, the great popularity of DS-3 circuits suggests that the nationwide average cost is also made unreliable.

⁷ The 1999 study included state private lines, a service that is more distributed to rural areas than to large cities. Private lines, for example, include "barn lines" that are commonly used to connect farm barns with the farmhouse,

The effect of the Bureau's calculations is that the model erroneously assumes new "phantom housing" had been constructed in every wire center. This assumption is erroneous, material, and not neutral in its effect. In urban wire centers, an increase in line density normally has a minimal effect. Costs are relatively insensitive to line density in urban areas. The cost curve is flat, and a given increase in density generally produces only a small, possibly negligible, reduction in cost.

Increasing line density, however, is very likely to produce a more substantial cost reduction in rural study areas. Costs are highly sensitive to line density in sparsely populated areas. Adding a few hundred phantom lines in a rural wire center can substantially reduce the modeled cost in that wire center. At the study area level, this will tend to substantially reduce modeled costs, but not real costs, in predominantly rural states like Maine and Vermont. That, in turn is likely to lead to insufficient support.

2. The wire center problem - misallocation of lines

Based on our general understanding of the communications industry in our states, we are aware that large capacity special access lines are being installed in three areas. They are being installed in larger cities, where CLECs and large businesses tend to be located. In addition, they are being installed in other wire centers where a CLEC or CLEC/ISP is located and in wire centers with a significant business enterprise. In these wire centers, the Bureau's procedures underestimate true special access line counts. Conversely, in many or most smaller and rural

and may have included alarm circuits that are not voice grade circuits.

wire centers, the model has the effect of erroneously assuming that too many special access lines have been added.

One expected effect of the error would be to understate costs in most rural wire centers (excepting the few with CLECs or significant numbers of enterprise customers). Another expected effect would be to overstate costs in urban areas. But, once again, because urban areas are less sensitive to line density changes, the overall effect would be to reduce costs in rural states.

D. Verizon Special Access Data

Responding to a 2003 request from the Maine Public Utilities Commission and the Vermont Public Service Board, Verizon submitted detailed special access data for Maine and Vermont.⁸ The data were based on the same ARMIS 43-08 line counts submitted on April 1, 2002 and reflect the end of 2001. The reports detail the number of DS-1 and DS-3 lines actually served by Verizon in each wire center in Maine or Vermont. From these data we calculated voice-grade-equivalent channels for each wire center using the Bureau's rules described above. The new data were then compared to existing Bureau data that had been used for the 2002 support year calculation. The analysis proves that the Bureau's methodology is unreliable and does not reflect reality.

1. The magnitude of the study area problem

⁸ Consistent with earlier FCC orders, Verizon has claimed confidential treatment for the wire center detail it provided to us. Accordingly, this filing has been generalized to remove the possibility that third parties could infer the special access line counts of any particular wire center. Unredacted Verizon data and calculations have

In Vermont and Maine, the inclusion of DS-3 lines in ARMIS increased the reported total number of special access lines by 58 percent. This means that, as we anticipated, when the Bureau received input data from the 2002 ARMIS report, the model erroneously assume an inaccurately high number of special access lines. Because the cost of a DS3 line is substantially different from the cost of 107 circuit pairs, the error undermines the merit of the model's cost outputs. As noted above, the effect is to substantially reduce the recognition of real costs in predominantly rural states like Maine and Vermont. That, in turn is likely to lead to insufficient support.

2. The magnitude of the wire center problem

The Verizon data also show that the second DS-3 problem, the misallocation to wire centers, is substantial. The Verizon data show wire centers with substantial and frequent errors of both kinds in the Bureau data. At one extreme, 14 of every 15 lines in one wire center were phantom lines. At the other extreme, for every line reported in the Bureau data, an additional 3.6 lines should be added.

More alarming, the errors are biased by size. For small wire centers with less than 3,000 switched access lines, the Bureau overstated special access lines in 83 percent of the cases. For larger wire centers, the opposite was true. For wire centers with at least 10,000 switched access lines, the Bureau understated the true value in 58 percent of the wire centers. As expected, wire centers with large understated line counts tend to fall into three groups: 1) larger cities; 2) mid-

sized wire centers where there is CLEC collocation or a home office of a CLEC/ISP; and 3) Mid-sized wire centers with a known significant business enterprise.

All of these findings show that, even two years ago, the Bureau methodology was materially unreliable and did not reflect reality. The Bureau overestimated special access lines in small wire centers and underestimated special access lines in large wire centers. Therefore, the special access line counts used in the Bureau's cost calculations are unreliable for both urban and rural areas. As expected, the biases in these data tend to improperly and substantially reduce support for Maine and Vermont ratepayers.

3. The 2004 Line Counts Update Order.

The Bureau has previously reviewed this Verizon data. In its 2004 Line Counts Update Order, issued in December of 2003, the Bureau rejected any finding of bias against rural areas in its special access line count methodology.⁹ The Bureau's analysis and reasoning was deficient in several ways, and the Bureau should carefully review it here with a fresh eye.

The 2004 Line Counts Update Order resolved a Petition For Reconsideration that had been filed in 2002 by the Rural State Commissions. In that petition, we had asserted, as we do here, that the Bureau's special access line count procedures create a bias against rural areas and that the Verizon data amply demonstrates this bias. Our analysis had been based upon 2000 ARMIS data. In its 2003 decision, the Bureau substituted 2001 ARMIS data and performed its own analysis of the Verizon data. The Bureau concluded, based on this new data, that there was

⁹ 2004 Line Counts Update Order, DA 03-4070, released Dec. 24, 2003.

no bias.¹⁰

The 2004 Line Counts Update Order relied in part upon a finding regarding the errors for 24 wire centers with 10,000 lines or more. For this limited group, the Bureau concluded its “methodology assigns a higher percentage of lines than the Verizon data in most wire centers.”¹¹

While this is undoubtedly true, it does not rebut our underlying contention. The Bureau’s observation is limited to 24 of the largest wire centers in Maine and Vermont, not the entire set. No effort was reported to examine the effect on smaller, rural wire centers, the key issue.

The discussion in the order overlooked the Bureau’s own published finding on the broader and more relevant question. In its attachment to the order, the Bureau specifically found that, even using the 2001 ARMIS data, there was a 0.541 correlation between the size of a wire center and the direction of the error. The note at the bottom of the Bureau’s published chart stated that:

At the level of significance $\alpha=0.050$ the decision is to reject the null hypothesis of absence of correlation. In other words, the correlation is significant.

There is no ambiguity here. Considering all the cases, and considering the magnitude of the errors (as the correlation coefficient is designed to do), the only possible conclusion is that significant bias exists. The Bureau’s methodology seriously under-counts the special access lines in the largest cities in both states, and on average it understates special access line counts in larger wire centers. Conversely, it harms rural areas by overstating special access line counts in

¹⁰ *Id.*, para. 15.

¹¹ *Id.*, para. 19.

smaller wire centers.

In order to justify disregarding its own strong evidence of bias, the Bureau's order simply dismissed that finding with the bald assertion that two large wire centers, Portland, Maine, and Burlington, Vermont, were "outlier data points."¹² The order never explained why these two points were "outliers." To the contrary, these two cities are central to the underlying point. It is precisely in Burlington and Portland that many of the special access lines are being purchased. That is where major enterprises and competitive carriers are locating, and that is where DS-3 lines are being sold. The Bureau's methodology understates the line counts in those two cities while arbitrarily shifting those lines to rural areas.

In addition, the 2004 Line Counts Update Order used an inappropriate legal standard. It rejected our supposed assertion that "the goal of the allocation methodology is to achieve an exact correspondence between the lines assigned to a given wire center in the model and the actual number of lines served." Rather, the order stated a goal of achieving "reasonable results that are consistent with the Commission's forward-looking cost criteria using the best available data."¹³

The Bureau should reconsider and reject this statement of the law. The nonrural high-cost support program distributes hundreds of millions of dollars of support, and it provides the primary basis for reasonable rates for more than 90 percent of customers in the country. It is not on its face sufficient to base such a program merely upon data that happen to be "available."

¹² *Id.*, para. 19.

Rather, the Bureau has an obligation to ensure that the data it uses to calculate costs are sufficiently accurate to “form the basis of rational decision-making.”¹⁴ Using DS-2 and DS-3 channel counts for 2003 as input in a model that never anticipated such data does not form a rational basis of decision making about which states need high-cost support. Neither does using a six-year-old data base on the location of special access lines.

E. The size of the effects in 2003

In the current notice, the Bureau is again proposing to update special access lines, this time with 2003 special access line counts. The number of DS3 lines was large enough in 2001 to have a substantial distorting effect on line count results. The problem is likely to be more severe two years later.¹⁵ Both kinds of distortions are also likely to be worse now.

- DS-3 circuits are now frequently purchased by large customers and by Interexchange carriers. If there are more large capacity special access lines in 2003 than there were in 2001, the Bureau will create more phantom lines than ever before.
- In addition, the allocation factors derived from the 1999 is now two years older. The actual location of these lines is even less likely to correlate to the 1998 data.

F. Conclusion

The partial updating of line count data, by using new study area totals without using new wire center data, distorts the cost results of the model and substantially harms the Verizon

¹³ *Id.*, para. 29.

¹⁴ *Qwest v. FCC*, 258 F.3d 1191, 1206 (10th Cir. 2001).

¹⁵ We pointed out almost three years ago that this problem was likely to assume increased importance in coming years. CC Docket No. 96-45, *Petition for Reconsideration filed by Maine Public Utilities Commission and the Vermont Public Service Board, Federal-State Board on Universal Service*, CC Docket No. 96-45, filed Feb. 22, 2002, at 22.

ratepayers in Maine and Vermont. It would be arbitrary and capricious for the Bureau to selectively update data when it knows that doing so would exacerbate existing errors.

III. UNE DATA

According to our best information, some, possibly most, local exchange carriers do not consider loop Unbundled Network Elements (“UNEs”) as “lines” for ARMIS reporting purposes. If carriers are excluding UNE platform lines or UNE loops from line counts, cost model results in wire centers with substantial UNE platform local competition will be unreliable.

The general effect of undercounting lines as an input is to increase the cost that the model believes to be an accurate output. Since competition is established primarily in urban areas, however, the effect is not ubiquitous. Undercounting UNE lines will primarily affect urban costs. This will tend to increase the national average cost and, all else equal, the benchmark. Undercounting UNE lines will not, however, have a significant effect in most rural areas. UNEs are not sold in large numbers in rural areas, particularly since UNE-P providers in many states do not even offer their local exchange service in rural UNE zones.

The net effect of higher national average cost, and unchanged rural cost, is a support reduction to high cost rural areas. Once again, the result is likely to be insufficient support to high cost areas in violation of section 254 of the Act.

IV. RECOMMENDATIONS

Unless the Commission is willing to collect valid and current data on special access lines,

it should not update its special access line counts with the new ARMIS special access data. The Commission should either update comprehensively or not at all. The current method feeds the model a potpourri of old and new input data and fails even to approximate reality. This may be convenient for the Bureau and for carriers because it relies on existing data sources. It has the demonstrable effect, however, of providing insufficient support to high-cost ILEC customers as well as too little portable support to customers of CLECs serving high cost areas.

One valid way to collect current data would be to fully and properly incorporate DS-3 lines into the model. This, however, would require the Commission to do three things. First, the Commission would have to modify the model to reflect how broadband facilities actually affect the cost of switched lines in the same exchange. Model modification is something that the Commission has frequently promised,¹⁶ but which it still has no known plans to undertake. Second, the Commission would need to alter the ARMIS report so that special access lines are reported separately, by size, and not on a per-voice-channel basis. Third, in order to improve wire center location data, the Bureau would need to issue a new data request to all nonrural local exchange carriers.¹⁷

¹⁶ See *2004 Line Counts Update Order* DA 03-4070 (Dec. 2003), para. 12 (“most prudent approach is to wait for further action by the Commission to consider several model improvements, specifically including the process for estimating special access demand”); *Id.*, para. 26 (“Commission has expressed its intention to initiate a proceeding to study proposed changes to the model inputs and model platform in a comprehensive manner”); *Fourteenth Report and Order* (May, 2001), para. 169 (“[W]e anticipate conducting a comprehensive review of the high-cost support mechanisms for rural and non-rural carriers as a whole to ensure that both mechanisms function efficiently and in a coordinated fashion.”); *Tenth Report and Order* (Nov., 1999), para. 28 (“We therefore have committed to initiating a proceeding to study how the model should be used in the future (e.g., how inputs data should be updated) and how the model itself should change to reflect changing circumstances.”)

¹⁷ Such a data request would direct carriers to report DS-3, DS-2, DS-1 and DS-0 special access lines separately, by wire center. The Commission should also validate the accuracy of the responses.

A second alternative is to exclude DS-2 and DS-3 data from ARMIS. This would require a simple change to ARMIS, but it is too late now to alter the 2004 ARMIS reporting rules.

If the Commission is unwilling to collect complete current data, it should not try to use a mixture of current general data and old specific data. As shown above, that distorts virtually all aspects of the Commission's support calculations. The distortions are not random; they harm rural areas. Rather, the Commission should return to a third alternative: using older special access line counts. The 2000 ARMIS special access line counts should be the data set that suffers the least from the problems identified above, while not suffering from other problems.¹⁸ While these line counts are not current, at least they minimize the cost distortions caused by feeding new special access data into a model that was never designed to receive such data and from treating those lines as if they had been installed in wire centers where they do not actually exist. Moreover, this older ARMIS report is more contemporaneous with the 1999 data request, and will produce fewer phantom rural lines.

The final alternative is to order that carriers receive support in 2005 equal to the greater of two amounts: 1) the amount already calculated for 2005 using the new proposed data; and 2) the amount actually distributed in 2000, the last year before these problems arose. Invalid calculations and data should be not used to reduce support to states that are entitled to the earlier support levels calculated when input data were more reliable. Only in this way can the Commission meet its Section 254(b) obligations to keep rural rates affordable and reasonably

¹⁸ The Bureau has previously identified significant problems with pre-2000 reporting year ARMIS data. See, *2004 Line Counts Update Order*, DA 03-4070, released Dec. 24, 2003, para. 23.

comparable to those in urban areas.

The Bureau should also direct carriers to include UNE lines in their switched line counts.

Respectfully submitted on November 5, 2004,

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